

### REMARKS

Claims 11-13 and 16-18 are rejected under 35 USC §102(e) as being anticipated by Kadota et al., U.S. 2001/0034115.

Applicants respectfully traverse the rejection.

Independent claims 11 and 16 have now been amended to recite an annealed p-type ZnO layer directly positioned on said n-type annealed ZnO layer. The annealed p-type ZnO layer includes nitrogen deposited under hydrogen reducing conditions as a dopant to produce p-type conductivity. The annealed n-typed ZnO layer includes Ga as a dopant to produce n-type conductivity.

Kadota et al. '115 describes a method for forming a p-type semiconductor film.

In contrast, claims 11 and 16 recite an annealed n-type ZnO layer being directly positioned on a substrate and an annealed p-type ZnO layer being directly positioned on said n-type ZnO layer. Kadota et al. '115 describes forming a p-type ZnO layer positioned on substrate and a n-type ZnO layer formed on the p-type ZnO layer. In addition, Kadota et al. '115 states a p-type ZnO/n-type ZnO structure would need an added an un-doped ZnO layer would be needed. Clearly, the annealed p-type ZnO/annealed n-type ZnO structure, as recited in claims 11 and 16, does not require an un-doped ZnO layer.

Moreover, Kadota et al. '115 describes using Al as an n-type dopant, however, claims 11 and 16 recite the annealed n-typed ZnO layer having **Ga** as a dopant to produce n-type conductivity. Furthermore, Kadota et al. '115 states N<sup>+</sup> ions are implanted on ZnO films to produce p-type conductivity, however, claims 11 and 16 recite the annealed p-type ZnO layer includes nitrogen deposited under hydrogen reducing conditions as a dopant to produce p-type

conductivity. Depositing nitrogen under hydrogen reducing conditions increases high donor concentration will, in turn, accommodate a high impurity acceptor density into solid solution.

The Examiner is reminded that product by process limitations can be allowed given that there are new structural terms. In the matter of *In re Garnero*, the court ruled the mere presence of a method limitation in an article claim which is otherwise allowable would not so poison the claim as to render it unpatentable.<sup>1</sup> In the present application, the new structural elements are the annealed n-type ZnO layer and annealed p-type ZnO layer, which Kadota et al. '115 does not teach or suggest.

Accordingly, Applicants contend that Kadota et al. '115 does not anticipate independent claims 11 and 16.

As to claims 12-13 and 17-18, they are dependent on claims 11 and 16, respectively. Therefore, claims 12-13 and 17-18 are also allowable for the same reasons argued with respect to claims 11 and 16.

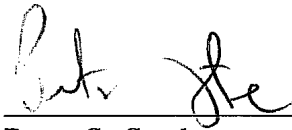
In view of the above amendments and for all the reasons set forth above, the Examiner is respectfully requested to reconsider and withdraw the rejection made under 35 U.S.C. §§102 and 112, second paragraph. Accordingly, an early indication of allowability is earnestly solicited.

---

<sup>1</sup> *In re Garnero*, 412 F.2d 276, 279 n. 8, 162 USPQ 221 (CCPA 1969)

If the Examiner has any questions regarding matters pending in this application, please feel free to contact the undersigned below.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read 'Peter S. Stecher', is written over a horizontal line.

Peter S. Stecher  
Registration No. 47,259  
Gauthier & Connors LLP  
225 Franklin Street, Suite 2300  
Boston, Massachusetts 02110  
Telephone: (617) 426-9180  
Extension: 126